



# Volunteer Lake Assessment Program Individual Lake Reports

## MESSER POND, NEW LONDON, NH

### MORPHOMETRIC DATA

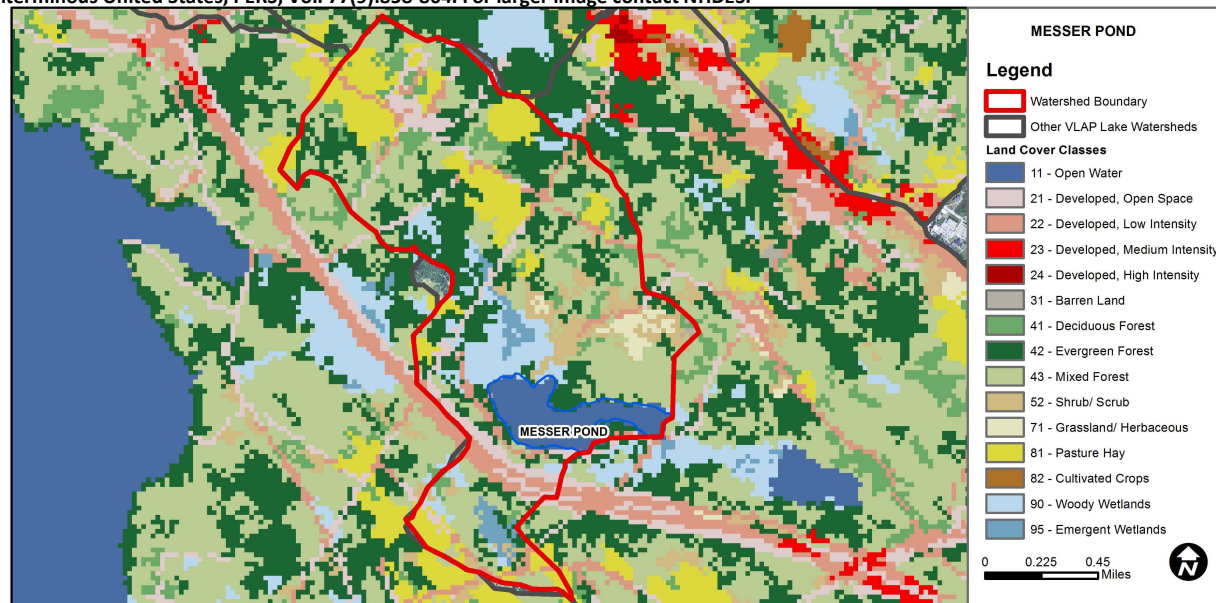
Watershed Area (Ac.):	1,408	Max. Depth (m):	7.6	Flushing Rate (yr <sup>-1</sup> ):	4.7	Year	Trophic class	KNOWN EXOTIC SPECIES
Surface Area (Ac.):	67	Mean Depth (m):	2.6	P Retention Coef:	0.53	1981	MESOTROPHIC	
Shore Length (m):	3,200	Volume (m <sup>3</sup> ):	704,000	Elevation (ft):	1105	1996	MESOTROPHIC	

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at [www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm](http://www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm)

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Bad	>10%, with a minimum of 2, samples exceed criteria, with 1 or more by a large margin.
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen saturation	Cautionary	There are < 10 samples with 1 exceedance of criteria. More data needed.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

### WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.45	Barren Land	0.1	Grassland/Herbaceous	1.45
Developed-Open Space	6.29	Deciduous Forest	5.19	Pasture Hay	13.19
Developed-Low Intensity	5.96	Evergreen Forest	23.27	Cultivated Crops	0
Developed-Medium Intensity	0	Mixed Forest	23.73	Woody Wetlands	6.57
Developed-High Intensity	0	Shrub-Scrub	5.23	Emergent Wetlands	2.16



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

## MESSER POND, NEW LONDON

### 2014 DATA SUMMARY

#### OBSERVATIONS AND RECOMMENDATIONS (Refer to Table 1 and Historical Deep Spot Data Graphics)

- ◆ **CHLOROPHYLL-A:** Chlorophyll levels were low in June, increased in July and August, and then decreased to average levels in September. The 2014 average chlorophyll levels were greater than the state median yet decreased from 2013. Historical trend analysis indicates relatively stable chlorophyll levels with moderate variability between years; in particular chlorophyll levels have become increasingly variable since 2010.
- ◆ **CONDUCTIVITY/CHLORIDE:** Deep spot conductivity levels remained elevated and greater than the state median. Historical trend analysis indicates highly variable epilimnetic (upper water layer) conductivity since monitoring began. County Rd. Inlet and Outlet conductivity were also slightly elevated. Brown and Nutter Inlet conductivity levels remained greatly elevated due to runoff from I-89 (a salted highway). Conductivity levels at 219 Field Acres Rd. were also elevated.
- ◆ **E. COLI:** E. coli levels at all stations were low and much less than the state standard for surface waters (406 cts/100 mL).
- ◆ **TOTAL PHOSPHORUS:** Epilimnetic phosphorus levels were slightly above average yet stable from June through August. Historical trend analysis indicates relatively stable epilimnetic phosphorus since monitoring began, however variability has increased since 2008. Hypolimnetic (lower water layer) phosphorus levels remained stable from June to July and then increased in August and were slightly above average. The increased August phosphorus levels may have been caused by the release of phosphorus from bottom sediments when dissolved oxygen levels fall below 1.0 mg/L, a process referred to as internal phosphorus loading. Brown Inlet phosphorus levels were elevated in July following a significant storm event and flushing of wetland systems, and were also elevated in August when water flow was stagnant. County Rd. Inlet and Outlet phosphorus levels were within a low to average range. Nutter Inlet phosphorus levels were the highest in July following the significant storm event but were average in August and September and the 2014 average phosphorus level remained lower than the historical average.
- ◆ **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was best in June, decreased in July and August likely due to the higher algal growth, and decreased again in September due to wind and wave action. Average transparency was less than the state median and historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began. Transparency measured with the viewscope (VS) was generally better than that measured without and likely a better representation of conditions.
- ◆ **TURBIDITY:** Epilimnetic turbidity increased with increasing algal growth and was slightly elevated. Hypolimnetic turbidity was average in June and July and elevated in August potentially due to the accumulation of organic compounds as the summer progresses and dissolved oxygen levels decrease below 1.0 mg/L. Brown Inlet turbidity was slightly elevated in July following a significant storm event and greatly elevated in August due to stagnant conditions. Outlet turbidity was also slightly elevated in July following the significant storm event. Turbidity at all other stations were within average ranges for those stations.
- ◆ **PH:** Epilimnetic pH levels were within the desirable range 6.5-8.0 units however hypolimnetic pH levels were less than desirable. Historical trend analysis indicates significantly increasing (improving) epilimnetic pH since monitoring began. We hope to see this continue! Brown Inlet pH levels were low due to the high content of humic, fulvic and tannic acids from decomposing organic matter. All other tributary pH levels tend to fluctuate within the desirable range.
- ◆ **RECOMMENDED ACTIONS:** Continue work to develop the Watershed Management Plan to identify and quantify pollution sources within the watershed. The Watershed Management Plan is an important step in order to focus management activities within the watershed. Keep up the great work!

**NH Water Quality Standards:** Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

**Chloride:** > 230 mg/L (chronic)

**E. coli:** > 88 cts/100 mL – public beach

**E. coli:** > 406 cts/100 mL – surface waters

**Turbidity:** > 10 NTU above natural level

**pH:** between 6.5-8.0 (unless naturally occurring)

**NH Median Values:** Median values for specific parameters generated from historic lake monitoring data.

**Alkalinity:** 4.9 mg/L

**Chlorophyll-a:** 4.58 mg/m<sup>3</sup>

**Conductivity:** 40.0 uS/cm

**Chloride:** 4 mg/L

**Total Phosphorus:** 12 ug/L

**Transparency:** 3.2 m

**pH:** 6.6

Station Name	Table 1. 2014 Average Water Quality Data for MESSER POND								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	8.67	5.99	140.1		14	2.24	2.76	1.50	6.65
Hypolimnion			150.6		18			2.33	6.22
219 Forest Acres Rd			477.0		5			1.25	7.21
253 Forest Acres Rd				1					
Brown Inlet			382.5	35	44			7.76	6.10
County Rd 2			108.0		15			2.56	6.58
County Rd Inlet			107.2		10			1.14	6.36
Nutter Inlet			283.5	34	20			1.21	6.58
Outlet At Bog Rd			135.3		9			0.85	6.69

#### HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data moderately variable.
pH (epilimnion)	Improving	Data significantly increasing.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data show low variability.

